

# ANNUAL INDEX

# 1962

## technical articles

volumes 48 and 49

All articles published in the Technical section of THE TOOL AND MANUFACTURING ENGINEER during 1962 are listed in alphabetical order in this index. Also listed are the authors of all articles. These listings include Gadgets and Tech Digests departments.

A highly reliable source of information, this index will be of use to you in the coming years as a record of the engineering information published by TME—the official publication of your Society.

# THE tool AND manufacturing engineer

AMERICAN SOCIETY OF TOOL AND MANUFACTURING ENGINEERS  
10700 PURITAN AVENUE • DETROIT 38, MICHIGAN

# 1962 AUTHOR INDEX

## A—

- Adams, F. A.—Indexing Fixture for Drilling Radial Holes\*, June p. 63  
 Alberlin, L. and C. C. Lacy—Heat Treat Technique\*, June p. 178  
 Albrecht, Paul—Metalcutting Vibrations\*, May p. 276  
 Ames, Robert S., J. Byron Jones, Florence R. Meyer, R. J. Laney, D. H. Lane, C. A. Forbes and H. E. Ricks—Applied Ultrasonics\*, May p. 281  
 Anter, Rudy—Cut Your Tool Costs Through Scientific Management, Apr. p. 81  
 Aoki, Isao and Tomojiro Tottori—Oxygen-Lanced Cast Iron\*, July p. 148  
 Asakura, R. C.—Sheet Forming Plastics\*, Feb. p. 162  
 Avitzur, Betzalel—Wire Drawing\*, Oct. p. 171  
 Ayvazian, A. M. and C. R. Hyland—Taking Short Cuts with Epoxy Plastic Tooling, May p. 103

## B—

- Barker, M. G.—Indicator Mounting Increases Machine Accuracy\*, Feb. p. 60  
 Bartin, Chester S.—Cutting Tool Control—organized program gets results, Dec. p. 71  
 Bartnik, S. Robert—Cold Extrusion\*, Aug. p. 524  
 Beebe, Alexander M., Jr.—Maintenance Evaluation\*, Mar. p. 196  
 Beggs, Harry G.—What Management Expects from Machine Tool Distributors\*, Jan. p. 159  
 Bell, J. W. and P. J. Sim—Optical Tooling Checks Furnace Roll Alignment, Mar. p. 99  
 Biagi, John E.—Punch-Die Clearances—Their Effects on Stamping Forces, July p. 89  
 Biehl, H. R.—Inspection of Powder Metal Parts\*, Oct. p. 173  
 Black, T. W.—Advance Manufacturing Planning—key to job shop efficiency, Aug. p. 43  
 Engineering for Efficiency, May p. 81  
 Engineering with Ideas—A Look at Space-Age Manufacturing Research, Apr. p. 111  
 Fundamentals of Vibratory Finishing, Nov. p. 93  
 High-speed Honeycomb Contouring—Band-sawing Does the Job, Mar. p. 85  
 Lasers Cast Light on Machining, Welding Problems, June p. 85  
 Manufacturing Planning Pays Off—Puts Fluid Power in Polaris, Jan. p. 81  
 Short-Order Manufacturing Department Cooks Up Lead Time Savings, Sept. p. 83  
 The Role of Science in Soviet Industry, July p. 63  
 Tips on Writing Engineering Reports, Feb. p. 72

- West Coast Industry, Sept. p. 123  
 Bocharov, Y., S. Kobayashi and E. G. Thompson—Research in Coining\*, May p. 279  
 Brachman, R. J., G. Staton and A. Chalfin—Diagnosing Failures\*, July p. 147  
 Bracken, William O.—Blow Molding\*, Feb. p. 163  
 Breen, John M.—Die Design Promotes Press Safety\*, Mar. p. 81  
 Brenner, Walter—New Electronic Plastics\*, Oct. p. 174  
 Brewer, R. C. and K. K. Punja—Orthogonal Machining\*, Nov. p. 189  
 Bright, R. Louis—From Westinghouse Research, Aug. p. 522  
 Broderick, R. F. and E. A. Rothman—Shot Peening Aluminum\*, Oct. p. 172  
 Brothers, A. J. and S. Yukawa—Prestressed Steel\*, July p. 147  
 Brown, R. D., R. A. Burton and P. M. Ku—Friction and Wear of Cermet\*, Mar. p. 194  
 Brownsell, Clifford—Numerically Controlled Indexer Eliminates Drill Fixtures, Dec. p. 100  
 Buescher, W. E., R. Silverman and L. S. Castelman—Properties to Order\*, Nov. p. 188  
 Burrage, B.—Drafting Board Guard Improves Drawings\*, Nov. p. 81  
 Burton, R. A., R. D. Brown, and P. M. Ku—Friction and Wear of Cermet\*, Mar. p. 194  
 Butt, Frank—Milling Machine Fixture Rolls Curved Parts\*, Apr. p. 87

## C—

- Calenoff, Raymond—Inspections and Preventive Maintenance\*, Mar. p. 197  
 Castelman, L. S., W. E. Buescher and R. Silverman—Properties to Order\*, Nov. p. 188

\*Brief article less than 1 page.

- Cavagnaro, Erman V.—Getting Top Quality Springs Through Setup Control, Apr. p. 101  
 Chalfin, A., G. Staton and R. J. Brachman—Diagnosing Failures\*, July p. 147  
 Chopra, S. N., W. B. Rice and R. Salmon—Chip Formation\*, Oct. p. 172  
 Cole, R. R. and J. Frisch—Effects of Electrolytic Grinding\*, May p. 279  
 Conn, Harry—When Portable Punches Save Money, Sept. p. 95  
 Cook, N. H., D. M. Gujral and V. A. Tipnis—Higher Speeds for Punch Presses? May p. 97  
 Cooper, H., Charles H. Fogarty and Robert E. Wilbert—Production Flexibility\*, June p. 177  
 Corbett, Stanley W.—Organization Comes to the Toolcrib, Oct. p. 83  
 Coville, David M.—How to Measure the Effectiveness of Manufacturing Planning, Aug. p. 62  
 Cox, D. B., E. A. Oberright and R. J. Green—Radiation and Lubricants\*, Feb. p. 164  
 Crain, Chester R.—Open Setup Inspection of Functionally Dimensioned Parts, Oct. p. 79  
 Crewe, L. C., Jr. and E. J. Crum—Improving Wire Draws Through Proper Lubrication, Feb. p. 67  
 Cross, J. A. and C. L. Faust—Chemical Machining\*, Aug. p. 521  
 Crum, E. J. and L. C. Crewe, Jr.—Improving Wire Draws Through Proper Lubrication, Feb. p. 67

## D—

- Dahl, Hjalmar—Assembly Jig Helps Load Riveting Die\*, July p. 66  
 Tube Ends Reduced by Novel Die\*, Feb. p. 61  
 Dallas, Daniel B.—Automatic Assembly of Glass and Steel, Jan. p. 69  
 Electron Beam Welding, July p. 68  
 Keeping Informed—a big problem in engineering, Aug. p. 51  
 Millilitchs or Microns—which measuring system?, Oct. p. 75  
 Pressworking '62 Features Low-Cost Tooling, Feb. p. 85  
 Daily, Robert—Cam Milling Fixture Is Quick Clamping\*, Sept. p. 82  
 Darnell, C. W., Jr.—Cast Nylon Tooling—better than metals?, Dec. p. 78  
 Davis, Benjamin G.—Engineering Technicians Increase Engineer Productivity, Jan. p. 57  
 DeAmicis, R.—Twelve Ways To Cut Manufacturing Costs, Jan. p. 91  
 Delpidio, D. and G. Driscoll—Semiautomatic Drilling Machine Built from Standard Components, Aug. p. 75  
 DeVos, Leon—Specifying Gears and Splines—for necessity and convenience, Aug. p. 55  
 Dickson, Robert M.—Checking Gage-Block Setups\*, Feb. p. 62  
 Inexpensive Tool Speeds Casting Layout\*, Aug. p. 50  
 Doyle, T. E., P. J. Keenan, W. J. Plant, F. G. Singleton and K. A. Schaefer—Thermosetting Acrylics\*, Oct. p. 174  
 Driscoll, G. and D. Delpidio—Semiautomatic Drilling Machine Built from Standard Components, Aug. p. 75

## E—

- Eary, Donald F.—Press and Die Alignment—key to stamping efficiency, Dec. p. 109  
 Eldridge, W. R.—Assembly Provides Support for Long Components\*, Aug. p. 48  
 Disappearing Locator Insures Pin and Part Alignment\*, Sept. p. 80  
 Retaining Ring Holds Bushings on Assembly Arbor\*, July p. 67  
 Emerson, H. C.—Joining Space Age Metals\*, May p. 275  
 Engquist, R. D.—Resistance Welding of Electronic Assemblies, Oct. p. 89  
 Erdogan, F., O. Tunçel and P. G. Paris—Crack Tip Stress Intensity\*, Sept. p. 215  
 Eskelin, Arnold F.—End Milling of Tough Alloys, Nov. p. 110

## F—

- Faught, Harry—Block Stabilizes Grinder Shaft\*, Nov. p. 82  
 Fixture Clamp Has Fast Action\*, Oct. p. 66  
 Faust, C. L. and J. A. Cross—Chemical Machining\*, Aug. p. 521  
 Feingold, Norbert—Processing Tool Steels, Nov. p. 113  
 Findley, W. N. and R. M. Reed—Metalcutting Phenomena\*, Oct. p. 171  
 Fingerhut, Henry J.—Single-Point Face Contouring on an Automatic Chucker, June p. 95

- Fink, W. B. and H. K. Schierhold—Filament Winding—Case Maker for Polaris, Nov. p. 101  
 Fogarty, Charles H., H. Cooper and Robert E. Wilbert—Production Flexibility\*, June p. 177  
 Forbes, C. A., H. E. Ricks, Robert S. Ames, J. Byron Jones, Florence R. Meyer, R. J. Laney and D. H. Lane—Applied Ultrasonics\*, May p. 281  
 Frisch, J. and R. R. Cole—Effects of Electrolytic Grinding\*, May p. 279  
 Fruda, T. R. and H. C. Mouwen—Porous Metal Shapes\*, Nov. p. 189  
 Fussell, D. E., L. C. Too, W. F. Mathewson and J. C. Smith—Sounds and Heat Transfer\*, Nov. p. 187

## G—

- Gadd, J. D. and R. A. Jefferys—Coating Columbiun\*, Jan. p. 160  
 Gajdusek, Josef and Leo Petzela—The CO<sub>2</sub> Process\*, Aug. p. 519  
 Galimberti, J. M. and W. L. Kennicott—How To Eliminate Cutting Tool Vibration, Feb. p. 77  
 Garcin, F. M. J.—How To Design Assembly Machines Through Animated Drawings, Apr. p. 93  
 Gegner, Paul J.—Protection from Corrosion\*, May p. 277  
 Gerber, H. J.—Auxiliary Base Holds Drill Fixtures\*, May p. 88  
 Fixture Design Eliminates Reamer Bushing\*, Feb. p. 60  
 Gibbons, C.—Fixture Holds Screw for Cutoff\*, Nov. p. 81  
 Lathe Chuck Converted for Indexing\*, June p. 62  
 Micrometer Center Finder\*, Feb. p. 62  
 Giordano, Felix M.—Adhesive Bonding Metal Laminates, Aug. p. 57  
 Heavy Stampings Make Strong Parts, Sept. p. 87  
 New Production Process—Mechanical Plating, Mar. p. 82  
 Roll Peel Powder Metal Parts, May p. 125  
 Steam Treating—the Process and Its Applications, July p. 79  
 Wire Joining and Terminating—a guide to equipment and techniques, Dec. p. 81  
 Godfrey, D.—Composition of EP Films\*, Mar. p. 195  
 Golankiewicz, E. J.—Pusher Compensates for Irregularities in Stock Width\*, Dec. p. 76  
 Goldstein, M. H., Karle S. Packard and K. W. Packard—Beyond Reliability\*, Feb. p. 161  
 Green, R. J., D. B. Cox and E. A. Oberright—Radiation and Lubricants\*, Feb. p. 164  
 Grenda, J.—Special Attachment Spuds Wheel Dressing\*, July p. 65  
 Greve, John W.—Gear Checking Method Eliminates Errors, May p. 121  
 Gross, W. B.—Testing with Computers\*, July p. 147  
 Gujral, D. M., N. H. Cook and V. A. Tipnis—Higher Speeds for Punch Presses? May p. 97

## H—

- Hagstrom, Raymond—New Corrosion Protection for Magnesium Alloys\*, Mar. p. 193  
 Hahn, G. T. and R. I. Jaffee—Brittle Behavior of Materials\*, Oct. p. 171  
 Hamilton, Ken—Special Fixture for Three-Dimensional Milling\*, Aug. p. 49  
 Harvey, Richard F.—Scrambling Flaws Improves Quality of Rolled Parts, Apr. p. 105  
 Hays, L. E. and E. T. Wessel—Fracture of High-Strength Structural Steels\*, Aug. p. 522  
 Heberlein, M. F. W.—Impurities in Lead-Tin\*, Nov. p. 187  
 Helmke, E. C. and W. N. Lambert—Throwaway Inserts Increase Reliability of Machining Tests, Dec. p. 85  
 Henderson, John B.—Steel Ball in Bushing Holds Stock During Feeder Advance\*, July p. 67  
 Hobstetter, J. N.—Science of Materials\*, Dec. p. 175  
 Holmes, S. D.—No Drive Dog Required with This Caster\*, Dec. p. 76  
 Hug, G., A. O. Schmidt, J. J. Lonergan and J. R. Roubik—Milling with Carbides and Ceramics\*, Oct. p. 172  
 Hull, E. H.—Diamond Burnishing\*, Apr. p. 204  
 Hutzley, Floyd A.—Linear Vertex Clearances for Punch and Die Design, Apr. p. 117  
 Hyland, C. R. and A. M. Ayvazian—Taking Short Cuts with Epoxy Plastic Tooling, May p. 103

## I—

- Incardona, A. and H. H. Poett—Joggling Magnesium Extrusions, July p. 83

**Irwin, G. R.**—Crack Toughness\*, Sept. p. 216  
**Isetts, Roger**—No Cams Needed in This Multi-angle Pierce Die\*, Nov. p. 80  
Tubing Extends Range of Tap\*, Sept. p. 82

—J—

**Jablonski, Bernard**—Piercing Process Uses the Slug as a Punch, June p. 67  
**Jaffee, R. I. and G. T. Hahn**—Brittle Behavior of Materials\*, Oct. p. 171  
**Jefferson, T. B. and G. Woods**—Close Control Key to Welding Tool Steels, June p. 92  
**Jefferys, R. A. and J. D. Gadd**—Coating Columbium\*, Jan. p. 160  
**Johnson, Allen M.**—Gage Checks Eccentricity of Deep Holes\*, May p. 90  
How To Design Circular Recessing Tools, Feb. p. 63  
Reciprocating Slide Tests Moving Components\*, June p. 62  
**Jones, J. Byron, Florence R. Meyer, R. J. Lanyi, D. H. Lane, C. A. Forbes, H. E. Ricks and Robert S. Ames**—Applied Ultrasonics\*, May p. 281  
**Jost, H. D.**—Tests for Phenolics\*, Nov. p. 187

—K—

**Kaera, Kaarel**—Three-Pin Plate Speeds Corner Pickup\*, Oct. p. 66  
**Kasper, Louis**—Swivel Device Transfers Movement, Eliminates Stick-Slip\*, Apr. p. 86  
**Kattus, J. R. and H. L. Lessley**—Creep of Sheet Metals\*, Feb. p. 161  
**Kecceoglu, Dimitri and George M. Tomko**—Machinability of Cast Iron, Jan. p. 95  
**Keenan, P. J., W. J. Plant, F. G. Singleton, K. A. Schafer and T. E. Doyle**—Thermosetting Acrylics\*, Oct. p. 174  
**Kennicott, W. L. and J. M. Galimberti**—How To Eliminate Cutting Tool Vibration, Feb. p. 77  
**King, B. W. and R. J. Runck**—The Glass in FRPs\*, Mar. p. 197  
**Kitske, E. D. and R. J. McGary**—Molds in Cutting Fluids\*, Aug. p. 520  
**Khubertes, R. J.**—Fixture Provides Presetting of Boring Bars\*, Mar. p. 80  
**Kobayashi, S., E. G. Thomsen and Y. Bocharov**—Research in Coining\*, May p. 279  
**Ku, P. M., R. D. Brown and R. A. Burton**—Friction and Wear of Cermet\*, Mar. p. 194  
**Kunzenbacher, A. A.**—Grinding Coolants\*, Aug. p. 519

—L—

**LaCoursiere, Andrew J.**—Curved Shafts Drive Close-Proximity Drills\*, Dec. p. 75  
**Lacy, C. C. and L. Albertin**—Heat-Treat Technique\*, June p. 178  
**Lambert, W. N. and E. C. Helmke**—Throwaway Inserts Increase Reliability of Machining Tests, Dec. p. 85  
**Lane, D. H., C. A. Forbes, H. E. Ricks, Robert S. Ames, J. Byron Jones, Florence R. Meyer and R. J. Lanyi**—Applied Ultrasonics\*, May p. 281  
**Lanyi, R. J., D. H. Lane, C. A. Forbes, H. E. Ricks, Robert S. Ames, J. Byron Jones and Florence R. Meyer**—Applied Ultrasonics\*, May p. 281

**Lascoe, O. D.**—Plastic Tooling\*, June p. 177  
**Lehman, Roger**—Simulated Rocket Stage Tests a Transporter, Nov. p. 83  
**Lessley, H. L. and J. R. Kattus**—Creep of Sheet Metals\*, Feb. p. 161  
**Lettau, William H.**—Fixture Simplifies Reamer Sharpening\*, Dec. p. 77  
**Levesque, George N.**—Hydrostatic Spindles Hold Roundness to Millions\*, Oct. p. 67  
**Levi, R. and V. Sambrotto**—Easier Machining Tests\*, Sept. p. 217  
**Lewis, A., III and W. S. Tucker**—Diamond Dresser Improves Form Grinding Accuracy, Mar. p. 107  
**Lewis, T. G.**—Machining to Millions, Aug. p. 65  
**Lindenmeyer, Ray S.**—Device Simplifies Bushing Removal\*, Mar. p. 79  
**Liu, H. W.**—Fatigue Cracks\*, Aug. p. 526  
**Lotus, M. W.**—Fixture Design Eliminates Burns\*, Apr. p. 86

Lathe Fixture Holds Angle Iron for End Facing\*, Mar. p. 80  
Nut Serves as Fixture in Grinding a Dog Point\*, Feb. p. 61  
Saw Blade Performs Broaching Operations\*, Jan. p. 59  
**Lonergan, J. J., J. R. Roubik, G. Hug and A. O. Schmidt**—Milling with Carbides and Ceramics\*, Oct. p. 172

—M—

**Magnuson, Merrill C. and Edward C. Varnum**—Effect of Quantity Discount on Economical Lot Size, Dec. p. 101  
**Malerich, J. B.**—Machining Thin Disks\*, Sept. p. 216  
**Maple, J. D.**—Lapped Block Holds Work During Grinding\*, Apr. p. 85  
Magnetic Adapter for Checking Spindle Run-out\*, Oct. p. 64

\*Brief article less than 1 page.

**Marin, Joseph**—Creep of Riveted Joints\*, Feb. p. 163  
**Marshall, D. W. and F. J. McGarry**—Wire Reinforced Plastics\*, Nov. p. 188  
**Mathewson, W. F., J. C. Smith, D. E. Fussell and L. C. Too**—Sounds and Heat Transfer\*, Nov. p. 187

**Mead, D. J.**—Damping Treatments\*, Feb. p. 161  
**Meissner, R. C.**—Engineering Without Drudgery\*, Dec. p. 175  
**Meyer, Florence R., R. J. Lanyi, D. H. Lane, C. A. Forbes, H. E. Ricks, Robert S. Ames and J. Byron Jones**—Applied Ultrasonics\*, May p. 281

**Miller, Robert R.**—The Turn Mill\*, Aug. p. 520  
**Mohun, W. A.**—Abrasive Disk Grinding\*, Apr. p. 203

**Monaco, Guy**—Universal Fixture for Drilling Holes on Bolt Circles\*, May p. 89

**Monroe, Harry**—Maintenance of Numerical Controls on Machine Tools\*, Mar. p. 195

**Monteil, V. H.**—Techniques of Explosive Forming\*, Jan. p. 158

**Moore, Charles E.**—Industrial Inspection\*, Sept. p. 215

**Morrison, G. L.**—Government-Owned Tooling—Its Control, Use, Disposition, Mar. p. 75

**Morse, C. W.**—Effective Management of Manufacturing Engineering Projects, Oct. p. 61

Long-Range Planning—its role in manufacturing, Sept. p. 77

**Mote, C. W.**—Ring Rolling\*, June p. 177

**Mouwen, H. C. and T. R. Fruda**—Porous Metal Shapes\*, Nov. p. 189

**Moyer, G. J. and G. M. Sinclair**—Plastic Deformation and Rolling\*, Sept. p. 215

**Mulholland, James**—Piercing Punch Performs Three Operations\*, June p. 64

**Munroes, R. A.**—Adhesive Bonding Magnesium\*, Mar. p. 193

**Murata, R. and T. Takeyama**—Tool Wear\*, May p. 278

**Murray, Frank**—Clamping Device Simplifies Corner Welding\*, Jan. p. 59

Gage Measures Taper in Conical Parts\*, Apr. p. 87

—Mc—

**McGarry, F. J. and D. W. Marshall**—Wire Reinforced Plastics\*, Nov. p. 188

**McGray, R. J. and E. D. Kitske**—Molds in Cutting Fluids\*, Aug. p. 520

**McKewen, George E.**—Air Mounts Maintain Surface Plate Flatness, Apr. p. 99

**McLaughlin, A. D.**—Fixture Simplifies Number Stamping Operation\*, Nov. p. 80

**McLaughlin, Clint**—Pierce Die Has Automatic Indexer\*, Nov. p. 82

Spring Steel Speeds Indicating\*, May p. 89

—N—

**Newhouse, D. L.**—Fracture of Alloy Steels\*, Sept. p. 217

**Newman, Patrick**—Drill Bushing Always on Shaft Centerline\*, Oct. p. 65

Jig Plate Toolholder Simplifies Lathe Drilling\*, July p. 66

Special Holder Speeds Indicator Operation\*, Apr. p. 86

**Newman, S. F.**—Why GM Electrical Standards\*, Aug. p. 521

**Nichols, L. W.**—Unit Moves Hot, Heavy Work\*, Oct. p. 65

**Nickel, K. W.**—Rating Vendors\*, Sept. p. 215

Norquist, Warren E.—Evaluating the Quality Data System, Nov. p. 75

—O—

**Oberright, E. A., D. B. Cox and R. J. Green**—Radiation and Lubricants\*, Feb. p. 164

**Okusa, Kitao**—How Carbide Tools Fail, Apr. p. 88

**Owen, Thomas J.**—Choose the Right Thread Gage for the Job, May p. 113

—P—

**Packard, Karl S., K. W. Packard and M. H. Goldstein**—Beyond Reliability\*, Feb. p. 161

**Packard, K. W., M. H. Goldstein and Karl S. Packard**—Beyond Reliability\*, Feb. p. 161

**Pardo, Jose G.**—Cross-Slide Increases Lathe Accuracy\*, Mar. p. 81

**Paris, P. G., F. Erdogan and O. Tuncer**—Crack Tip Stress Intensity\*, Sept. p. 215

**Partridge, F. M. and J. R. Russell**—Layouts Transferred Photographically to Contoured Parts, May p. 110

**Perego, F. C. and B. B. Turney**—Electric Controls Increase Safety of Machine Tools\*, Feb. p. 163

**Petrasko, Leo and Josef Gajdusek**—The CO<sub>2</sub> Process\*, Aug. p. 519

**Phillips, Bryce W.**—Applying Value Analysis to Machine Tool Procurement, June p. 59

**Plant, W. J., F. G. Singleton, K. A. Schafer, T. E. Doyle and P. J. Keenan**—Thermosetting Acrylics\*, Oct. p. 174

**Plenard, Elisabeth**—Damping of Cast Iron\*, July p. 149

**Poett, H. H. and A. Incardona**—Joggling Magnesium Extrusions, July p. 83

**Poston, Irvin E.**—Tooling with Plastics\*, Aug. p. 526

**Powers, Thomas**—Increase the Effectiveness of Automatics, Sept. p. 105

**Punja, K. K. and R. C. Brewer**—Orthogonal Machining\*, Nov. p. 189

—R—

**Reed, R. M. and W. N. Findley**—Metalcutting Phenomena\*, Oct. p. 171

**Reingold, Alvin**—Ceramic Dies Speed Honeycomb Production, Mar. p. 97

**Reynolds, H. W. and S. J. Wheately**—New Machine Uses Broach for Ferrule Removal, Nov. p. 107

**Rheingold, Lawrence M.**—Capabilities of Steel-Rule Dies, June p. 79

**Rice, W. B., R. Salmon and S. N. Chopra**—Chip Formation\*, Oct. p. 172

**Ricks, H. E., Robert S. Ames, J. Byron Jones, Florence R. Meyer, R. J. Lanyi, D. H. Lane and C. A. Forbes**—Applied Ultrasonics\*, May p. 281

**Riley, Frank J.**—Design of Automatic Assembly Machines, May p. 91

**Riley, John J.**—The How and Why of Machine Capability Analysis, Sept. p. 97

**Rinehart, John S.**—Metalworking Explosives\*, Jan. p. 157

**Robinson, J. M.**—Ballizing—the Engineering of Holes, June p. 65

**Rothman, E. A. and R. F. Broderick**—Shot-Peening Aluminum\*, Oct. p. 172

**Roubik, J. R., G. Hug, A. O. Schmidt and J. J. Lonergan**—Milling with Carbides and Ceramics\*, Oct. p. 172

**Rowe, G. H. and J. R. Stewart**—Creep Rupture of a Welded Stainless Steel\*, Oct. p. 173

**Russell, J. R. and F. M. Partridge**—Layouts Transferred Photographically to Contoured Parts, May p. 110

—S—

**Salmon, R., S. N. Chopra and W. B. Rice**—Chip Formation\*, Oct. p. 172

**Sambrotto, V. and R. Levi**—Easier Machining Tests\*, Sept. p. 217

**Sata, Toshio and Hiroyuki Yoshikawa**—Grinding Wheel Wear\*, Apr. p. 204

**Schafer, K. A., T. E. Doyle, P. J. Keenan, W. J. Plant and F. G. Singleton**—Thermosetting Acrylics\*, Oct. p. 174

**Schierhold, H. K. and W. B. Fink**—Filament Winding—Case Maker For Polaris, Nov. p. 101

**Schmidt, A. O., J. J. Lonergan, J. R. Roubik and G. Hug**—Milling with Carbides and Ceramics\*, Oct. p. 172

**Sejournet, Jacques**—Glass as Lubricant\*, Aug. p. 520

**Shirinjev, W. V. and P. F. Vassilevsky**—Cooling of Steel Castings\*, July p. 150

**Siekmann, H. J.**—Oxide Tools up to Date, June p. 69

**Silverman, R., L. S. Castleman and W. E. Buescher**—Properties to Order\*, Nov. p. 188

**Sim, P. J. and J. W. Bell**—Optical Tooling Checks Furnace Roll Alignment, Mar. p. 99

**Simms, Charles C.**—Process Planning for Outer Space, Feb. p. 55

**Sinclair, G. M. and G. J. Moyer**—Plastic Deformation and Rolling\*, Sept. p. 215

**Singh, Inder Jeet**—Special Faceplate Simplifies Threading and Graduating\*, May p. 88

**Singleton, F. G., K. A. Schafer, T. E. Doyle, P. J. Keenan and W. J. Plant**—Thermosetting Acrylics\*, Oct. p. 174

**Sjostedt, William E.**—Axial Jaws Simplify Chucking of Fragile Parts\*, Sept. p. 81

**Skilarew, S.**—Reinforced Refractories\*, Feb. p. 164

**Smith, J. C., D. E. Fussell, L. C. Too and W. F. Mathewson**—Sounds and Heat Transfer\*, Nov. p. 187

**Smith, W. B.**—Special Tool Makes Uniform Chamfers\*, June p. 63

**Souler, R. Allen**—Putting Automatic Gaging to Work, Jan. p. 77

**Spencer, C. D.**—Casting Plastics\*, June p. 178

**Sperman, Jacob H.**—Hacksaw Die Cuts Tubing\*, Sept. p. 80

**Sprengel, Howard W.**—A New Approach to Quality Manufacturing, Feb. p. 92

**Staskauskas, Albert E.**—Clock Winder Taps Holes\*, Aug. p. 49

Not Runner Made From Socket Head Screw\*, May p. 90

**Staton, G. A., Chalmers, and R. J. Brachman**—Diagnosing Failures\*, July p. 147

**Stewart, J. R. and G. H. Rose**—Creep Rupture of a Welded Stainless Steel\*, Oct. p. 173

**Strasser, Federico**—Double Action Die Compensates for Short Press Stroke\*, Sept. p. 82

Double Locator Saves Metal\*, Jan. p. 80

**Swing, Edon**—Measurement of Castings\*, July p. 149

**Seales, Frank**—Index Head Has Many Uses\*, Oct. p. 64

—T—

- Takeyama, T., and R. Murata—Tool Wear\*, May p. 278  
 Tauser, Charles H.—New Die for Short-Run Stamping, May p. 115  
 Taylor, W. Gordon—How to Figure Fastening Costs, Aug. p. 69  
 Theilacker, George K.—Alignment Tool Provides Fast Lathe Center Correction\*, Jan. p. 60  
 Thomsen, E. G., V. Bocharov and S. Kobayashi—Research in Coining\*, May p. 279  
 Thomson, R. B.—Performance of Powder Metal Parts\*, Oct. p. 174  
 Tipnis, V. A., N. H. Cook and D. M. Gujral—Higher Speeds for Punch Presses? May p. 97  
 Todd, K.—Clamping Device Serves as Part Locator\*, Dec. p. 76  
 Tomko, George M. and Dimitri Kececioglu—Machinability of Cast Iron, Jan. p. 93  
 Too, L. C., W. F. Mathewson, J. C. Smith and D. E. Fussell—Sounds and Heat Transfer\*, Nov. p. 187  
 Torresen, Carl T.—Portable Riveter Is Driven by Drill Press\*, Aug. p. 48  
 Tottori, Tomojiro and Isao Aoki—Oxygen-Lanced Cast Iron\*, July p. 148  
 Tucker, W. S. and A. Lewis, III—Diamond Dresser Improves Form Grinding Accuracy, Mar. p. 107

- Tuncel, O., P. G. Paris and F. Erdogan—Crack Tip Stress Intensity\*, Sept. p. 215  
 Turley, Paul A.—Assembly Locates Circular Parts\*, July p. 65  
 Turney, B. B. and F. C. Perego—Electric Controls Increase Safety of Machine Tools\*, Feb. p. 163

—V—

- Valluri, Sitaram Rao—Unified Engineering Theory of Fatigue\*, Jan. p. 157  
 van der Burgt, J. H.—Swinging Mandrel Simplifies Closed Forming Operations\*, Dec. p. 77  
 Varin, Edward C. and Merrill C. Magnuson—Effect of Quantity Discount on Economical Lot Size, Dec. p. 101  
 Vassilevsky, P. F. and W. V. Shiriaev—Cooling of Steel Castings\*, July p. 150  
 Vaughn, Robert L. and Norman Zlatin—How New Materials Affect Part Productivity, May p. 100

—W—

- Wachtell, R.—Protecting Molybdenum\*, Jan. p. 159  
 Walker, W.—Arbor Attachment Enables Milling Machine To Bore\*, Oct. p. 66  
 Eccentric Boring Bar Has Simple Adjustment\*, Aug. p. 50  
 Wessel, E. T. and L. E. Hayes—Fracture of High-Strength Structural Steels\*, Aug. p. 522

—Y-Z—

- Yoshikawa, Hiroyuki and Toshiro Sato—Grinding Wheel Wear\*, Apr. p. 204  
 Yukawa, S. and A. J. Brothers—Prestressed Steel\*, July p. 147  
 Zlatin, Norman and Robert L. Vaughn—How New Materials Affect Part Productivity, May p. 100

# 1962 SUBJECT INDEX

—A—

- Abrasive blasting, airless\*, Aug. p. 74  
 Abrasive disk grinding, Apr. p. 203  
 Abrasives, diamond\*, Jan. p. 94  
 Abstracts, use in indexing systems, Aug. p. 51  
 Acceptance sampling, Nov. p. 77  
 Accountable tooling, definition of, Mar. p. 76  
 Acrylics, thermosetting\*, Oct. p. 174  
 Adapter, magnetic, for checking spindle runout\*, Oct. p. 64  
 Adhesive bonding, magnesium\*, Mar. p. 193  
 of metal laminates, Aug. p. 57  
 Air-electric gaging, Jan. p. 77  
 Air-electronic gaging, Jan. p. 77  
 Airfoil blades, machining, Aug. p. 59  
 Air gage for transmission inspection\*, Oct. p. 74  
 Air mounts, use in maintaining surface-plate flatness, Apr. p. 99  
 Alignment, press and die, Dec. p. 109  
 Alloy performance, predictability of\*, Sept. p. 110  
 Alloy steels, fracture of\*, Sept. p. 217  
 Alloy strip, powder rolled cathode\*, Nov. p. 188  
 Alloys, high-temperature, machining\*, Oct. p. 153  
 precipitation-hardening, brazing of, May p. 275  
 refractory, joining of, May p. 275  
 Alloys, thermal-resistant, classes of, Nov. p. 110  
 machining of, Nov. p. 110  
 Aluminum (1100-0), formability, Jan. p. 63  
 6061-T6, formability, Jan. p. 63  
 half-hard, stamping, Sept. p. 96  
 shot-peening\*, Oct. p. 172  
 steam treating of, July p. 81  
 Aluminum oxide, tools, June p. 69  
 stones, Nov. p. 93  
 use of in lasers, Aug. p. 86  
 use of in vibratory finishing, Nov. p. 97  
 Angle plate, magnetic\*, Mar. p. 79  
 Argon gas, Mar. p. 98  
 Army metrology, Oct. p. 76  
 Assembly arbor\*, July p. 67  
 Assembly, automatic, glass and steel, Jan. p. 69  
 Assembly jig for riveting die\*, July p. 66  
 Assembly machines, automatic, design of, May p. 91  
 design of, Apr. p. 93  
 Austenitic stainless steels, producibility rating of, May p. 101  
 Autocollimation telescope\*, May p. 243  
 Autocollimator, use in machine building, Aug. p. 66  
 Autopilot programming, Nov. p. 105  
 Automated wire crimping, Dec. p. 83  
 Automatic assembly, glass and steel, Jan. p. 69  
 Automatic chucker, contouring on, June p. 95  
 Automatic gaging, Jan. p. 77  
 Automatics, increasing effectiveness of, Sept. p. 105  
 Automation, circumferential, May p. 82  
 in barrel plating\*, Nov. p. 112  
 in vibratory finishing, Nov. p. 94  
 management attitudes toward, May p. 92  
 press, Feb. p. 85  
 Autospot programming, Nov. p. 105

—B—

- Backlash, elimination of in boring unit, Nov. p. 92; Dec. p. 155\*  
 Ball bearings, resilience of\*, Jan. p. 151  
 Ball burnishing\*, Jan. p. 151  
 Ball nuts, recirculating, Apr. p. 98  
 Ballizing, June p. 65  
 Balls, steel, use of in vibratory finishing, Nov. p. 97  
 Bandsaw contouring of honeycomb, Mar. p. 85  
 Barrel finishing compared with vibratory finishing, Nov. p. 94  
 Barrel plating, automatic in-line\*, Nov. p. 112  
 Bearing capacity of coated steels\*, Aug. p. 519  
 Bearing strength errors\*, Oct. p. 85  
 Bench presses, use in wire terminating, Dec. p. 82  
 Beryllium copper, steam treating of, July p. 81  
 Beryllium-nickel\*, Mar. p. 101  
 Beta distribution curve, June p. 76  
 Binary combinations, modified, Oct. p. 73  
 Blow molding\*, Feb. p. 163  
 Bonding of oxide tools, June p. 70  
 Bonus tolerances, Oct. p. 79  
 Boring attachment, milling machine\*, Oct. p. 66  
 Boring bar, eccentric\*, Aug. p. 50  
 Boring bars, composite, Feb. p. 79  
 Boring machine for centrifugal pump, Oct. p. 87  
 Boring mill vibrations\*, Sept. p. 201  
 Boring unit, preloaded, Nov. p. 92  
 Brass, half-hard, stamping, Sept. p. 96  
 steam treating of, July p. 81  
 Braze sandwich panel, June p. 83  
 Breakage, characteristics of, May p. 97  
 Brittle behavior of materials\*, Oct. p. 171  
 Broach material, Nov. p. 108  
 Broaching, Feb. p. 69  
 machine design, May p. 108  
 operations, saw blade\*, Jan. p. 59  
 Brock needle\*, Dec. p. 107  
 Buffing, automatic, Jan. p. 73  
 Burnishing, ball\*, Jan. p. 151  
 broach, Feb. p. 69  
 diamond\*, Apr. p. 204  
 Burr formation, characteristics and causes in stamping, May p. 99  
 Bushing assembly device\*, July p. 67  
 Bushing plate, self-centering\*, Oct. p. 65  
 Bushing removal device\*, Mar. p. 79

—C—

- Calcium soap in lubricating, Feb. p. 67  
 Calculating machine capability, Sept. p. 98  
 Cam milling fixture\*, Sept. p. 82  
 Capron\*, Sept. p. 201  
 Carbide, abrasives, Mar. p. 102  
 electrolytic grinding of\*, Dec. p. 155  
 dies, Feb. p. 89  
 milling cutters, failure in\*, Apr. p. 186  
 milling with\*, Oct. p. 172  
 tips, fatigue strength of\*, Feb. p. 149  
 tool manufacturing research\*, Apr. p. 186  
 tools, failure in, Apr. p. 88  
 versus steel, Feb. p. 78  
 Cast nylon tooling, Dec. p. 78

- Cast iron, damping of vibration in\*, July p. 149  
 finish rolling of\*, Feb. p. 151  
 oxygen-lanced\*, July p. 148  
 production of, Feb. p. 80  
 steam treating of, July p. 81  
 Casting, centrifugal, Aug. p. 47  
 of cylinder blocks, July p. 85  
 plastics\*, June p. 178  
 Castings, inspection of\*, Sept. p. 108  
 measurement off\*, July p. 149  
 Cemented oxide, June p. 69  
 Center finder, micrometer\*, Feb. p. 62  
 Centrifugal casting, Aug. p. 47  
 Centrifuge\*, Dec. p. 106  
 Ceramic dies, Mar. p. 97  
 Ceramics, milling with\*, Oct. p. 172  
 use of in vibratory finishing, Nov. p. 97  
 Cermetts, friction and wear of\*, Mar. p. 194  
 Chamfering tool\*, June p. 63  
 Channeling, in wire draws, Feb. p. 68  
 Chemical machining\*, Aug. p. 521  
 Chip formation\*, Oct. p. 172  
 Chipping in cutting tools, Apr. p. 88  
 Chuck loading device\*, Sept. p. 81  
 Chucking device\*, Sept. p. 81  
 Circuit board manufacture, Sept. p. 109  
 Circular part locating device\*, July p. 65  
 Circular recessing tools, design, Feb. p. 63  
 Clamp, fixture, fast acting\*, Oct. p. 66  
 Clamping force of collets\*, Mar. p. 190  
 Clearance, cutting, control of, Dec. p. 109  
 CO<sub>2</sub> process\*, Aug. p. 519  
 Coated steels, bearing capacity of\*, Aug. p. 519  
 Coating, columbium\*, Jan. p. 160  
 Cobalt-base alloys, producibility rating, May p. 101  
 components, machine welding of\*, Oct. p. 88  
 Cocoons, filament wound, Nov. p. 102  
 Coining, research in\*, May p. 279  
 Cold extrusion\*, Aug. p. 524  
 Collets, clamping force\*, Mar. p. 190  
 Columbium, coating\*, Jan. p. 160  
 Combination clamp and locator\*, Dec. p. 76  
 Composite boring bars, Feb. p. 79  
 Computers, Jan. p. 58  
 control of rolling mill, Dec. p. 92  
 testing with\*, July p. 147  
 Concrete, in explosive forming, Jan. p. 63  
 Confidence interval, Nov. p. 77  
 Contact operations (see Explosive forming)  
 Contouring of honeycomb, Mar. p. 85  
 Control inspection in assembly machines, May p. 93  
 Control records, Mar. p. 76  
 Controlled ventilation panes, assembly of, Jan. p. 70  
 Controls, electric\*, Feb. p. 163 (see also Numerical control)  
 Coolants, grinding\*, Aug. p. 519  
 Copper, formability, Jan. p. 63  
 rolled, stamping, Sept. p. 96  
 welding of, July p. 72  
 Corner pickup plate\*, Oct. p. 66  
 Corrosion prevention\*, May p. 277  
 protection for magnesium alloys\*, Mar. p. 193  
 protection of metal, Mar. p. 82  
 Cost, determination of by value analysis, June p. 78  
 Cost distribution curve, June p. 77  
 Costs, manufacturing, Jan. p. 91

\*Brief article less than 1 page.

Crack toughness\*, Sept. p. 210  
 Cracking, underbed, June p. 93  
 Crankshaft machining, Feb. p. 71  
 Cratering in cutting tools, Apr. p. 89  
 Creep, of riveted joints\*, Feb. p. 163  
 rupture of welded stainless steel\*, Oct. p. 173  
 Cross slide increases lathe accuracy\*, Mar. p. 81  
 Cupola design, Feb. p. 81  
 Cut-off mechanism in spring machines, Apr. p. 104  
 Cutting fluids, molds in\*, Aug. p. 520  
 Cutting force dynamometers\*, May p. 244  
 Cutting, orthogonal, Apr. p. 89  
     temperatures for oxide inserts, June p. 70  
     three-dimensional, Apr. p. 92  
 Cutting tool costs, Dec. p. 71  
 Cutting tool development, Aug. p. 45  
 Cutting tool manual (Sikorsky), Dec. p. 74  
 Cutting tools, failures, Apr. p. 88  
     high-speed, Jan. p. 88  
     vibration, Feb. p. 77  
 Cylindrical grinder, supporting device\*, Aug. p. 48

#### —D—

Damping of vibration, Feb. p. 78  
     in cast iron\*, July p. 149  
 Data system, quality, evaluating, Nov. p. 75  
 Deburring, by vibratory finishing, Nov. p. 94  
     with carbide abrasives, Mar. p. 102  
 Decarburization, occurrence in welding, June p. 93  
 Deformation of machine tools\*, June p. 165  
 Dental tools in deburring, Mar. p. 102  
 Deposition rates for welding, Nov. p. 86  
 Depth gage device\*, Apr. p. 86  
 Descaling by vibratory finishing, Nov. p. 94  
 Design, aluminum oxide tools, June p. 70  
     precision machine, Aug. p. 65  
     stampings, Sept. p. 89  
     trends in automatic chucking machines, May p. 84  
 Destructive testing, Nov. p. 77  
 Diamond, abrasives\*, Jan. p. 94  
     burnishing\*, Apr. p. 204  
     dresser, Mar. p. 107  
 Die, automatic indexing\*, Nov. p. 82  
     pierce, multiple-angle\*, Nov. p. 80  
 Die casting machines, Mar. p. 106  
 Die cutting of rubber, Jan. p. 76  
 Die design, double action die\*, Sept. p. 82  
     heavy stampings, Sept. p. 91  
     multiple hole piercing, June p. 68  
     safety\*, Mar. p. 81  
     short-run stampings, May p. 115  
 Die forming tests, Jan. p. 63  
 Die, hacksaw\*, Sept. p. 80  
 Die life, steel-rule dies, June p. 80  
 Die plate, elevating, May p. 115  
 Die, riveting\*, July p. 66  
 Die-set tooling for powder-metal parts, Sept. p. 94  
 Die setting\*, Mar. p. 93  
 Dies, beryllium-nickel\*, Mar. p. 101 (see also Pressworking)  
     carbide, Feb. p. 89  
     ceramic, Mar. p. 97  
     economy plate, Feb. p. 88  
     hydrostatic, Feb. p. 91  
     reusable, Feb. p. 86  
     steel-rule, Feb. p. 87; June p. 79  
 Dimensioning, functional, Oct. p. 79  
 Disk, thin, machining\*, Sept. p. 216  
 Disposable tooling, Jan. p. 88 (see also Insert tooling)  
 Distortion, control of in welding, June p. 93  
 Distribution curve, beta, June p. 76  
     cost, June p. 77  
 Dog point grinding fixture\*, Feb. p. 61  
 Drafting board guard\*, Nov. p. 81  
 Draw and form operations, Feb. p. 90  
 Drawings, animated, in machine design, Apr. p. 93  
 Drill fixture\*, Feb. p. 60; April p. 86\*; May p. 99\*  
     auxiliary base for\*, May p. 88  
     epoxy, May p. 103  
     for radial holes\*, June p. 63  
 Drillheads, rotating, Mar. p. 94  
 Drill jig, adjustable\*, Apr. p. 85  
 Drilling fixture, lathe\*, July p. 66  
 Drilling machine, semiautomatic, Aug. p. 75  
 Drilling, numerically controlled, Jan. p. 87; Sept. p. 109  
 Drills, spade versus twist, Sept. p. 106  
 Ductile iron in explosive forming, Jan. p. 63  
 Dynamometers, cutting force\*, May p. 244

#### —E—

Economics of heavy stampings, Sept. p. 89  
 Economy plate dies, Feb. p. 88  
 Education, engineering, obsolescence of\*, Sept. p. 86  
 Efficiency of manufacturing, improving, Sept. p. 85  
 Electrical discharge machining, Feb. p. 89  
 Electrical standards\*, Aug. p. 521  
 Electrochemical machining\*, June p. 73  
 Electrocoating, effect on grain, Apr. p. 203  
 Electrohydraulic forming, Jan. p. 61  
 Electrolytic grinding of carbides\*, Dec. p. 155  
     effects of\*, May p. 279

\*Brief article less than 1 page.

machining, Feb. p. 89; Aug. p. 46; Dec. p. 91\*  
 Electromagnetic forming, Jan. p. 66  
 Electron activation by grinding\*, Sept. p. 203  
 Electron beam, machining, June p. 89  
     welding, July p. 68; Oct. p. 82\*  
 Electronic assemblies, welding of, Oct. p. 89  
 Electronic gaging, Jan. p. 77  
 Electronic plastics\*, Oct. p. 174  
 Electroplating, tankless\*, May p. 120  
 Endurance testing mechanism\*, June p. 62  
 Engineering for efficiency, May p. 81  
 Engineering, mechanization of\*, Dec. p. 175  
 Engineering reports, writing, Feb. p. 72  
 Engineering with ideas, Apr. p. 111  
 English versus metric measurement, Oct. p. 75  
 EOG formulas, Dec. p. 101  
 EP films, composition\*, Mar. p. 195  
 Epoxy fixtures, advantages of, May p. 106  
 Epoxy in explosive forming, Jan. p. 63  
 Epoxy plastic tooling, May p. 103  
 Epoxy-resin laminate, Feb. p. 83  
 Erich facial fracture appliance\*, Dec. p. 108  
 Error, automatic compensation for\*, May p. 246  
 Estimating tool costs, Apr. p. 81  
 Expendable tooling, definition of, Mar. p. 76  
     storage of, Oct. p. 84  
 Explosive forming, Jan. p. 61; Jan. p. 158\*; Apr. p. 112  
 Explosive gas mixtures, Jan. p. 64  
 Explosive rubber impact forming, Apr. p. 113  
 Explosives, metalworking\*, Jan. p. 157  
 Extrusions, cold\*, Aug. p. 524  
     hydrostatic\*, July p. 82  
 Extrusions, magnesium, joggling, July p. 83

#### —F—

Fabricated machine tools\*, Oct. p. 154  
 Face milling, centrifugal forces in\*, Apr. p. 185  
 Faceplate, special\*, May p. 88  
 Fastening costs, estimating, Aug. p. 69  
 Fastening costs, table of, Aug. p. 70  
 Fastening operations in assembly machines, May p. 96  
 Fatigue cracks\*, Aug. p. 526  
 Fatigue strength of carbide tips\*, Feb. p. 149  
 Fatigue, unified engineering theory of\*, Jan. p. 157  
 Feeding device, for automatic assembly machines, May p. 94  
     stock\*, July p. 67  
 Ferrosferric oxide\*, Mar. p. 195  
 Ferrous metal, steam treating of, July p. 79  
 Ferrules, removal of, Nov. p. 107  
 Fiberglass in explosive forming, Jan. p. 63  
     in reinforced plastics\*, Mar. p. 197  
     use of in filament winding, Nov. p. 101  
 Filament winding, Nov. p. 101  
 Filler wire in arc welding\*, Oct. p. 155  
 Finishing compounds, use of in vibratory finishing, Nov. p. 99  
 Fixture, cam milling\*, Sept. p. 82  
     dog-point grinding\*, Feb. p. 61  
     drill, indexing\*, June p. 63  
     for pin and part alignment\*, Sept. p. 80  
     for presetting boring bars\*, Mar. p. 80  
     for three-dimensional milling\*, Aug. p. 49  
     number stamping\*, Nov. p. 80  
     numerically controlled boring, Jan. p. 90  
     part holding, epoxy, May p. 104  
     reamer sharpening\*, Dec. p. 77  
     screw cutoff\*, Nov. p. 81  
     tapping, acme threads\*, June p. 64  
     Fixture clamp, fast acting\*, Oct. p. 66  
     Fixture design, scientific\*, Nov. p. 165  
     Fixtures, welding, mechanized, Nov. p. 88  
     Fixturing for vibratory finishing, Nov. p. 99  
     Fixturing of honeycomb, Mar. p. 86  
     Flame cutting, numerically controlled, May p. 109  
     Flank wear patterns in cutting tools, Apr. p. 92  
     Flatness, surface plate, Apr. p. 99  
     Flaws, scrambling, Apr. p. 105  
     Fluorescence in lasers, June p. 86  
     Flux redistributor, July p. 78  
     Flywheels, automatic assembly, Jan. p. 74  
     Forging, automated, July p. 76  
     spin, Mar. p. 105  
     Forgings, cold rolling of\*, Jan. p. 89  
     Formability, Jan. p. 62  
     Forming, electrohydraulic, Jan. p. 61  
         electromagnetic, Jan. p. 66  
         explosive, Jan. p. 61; Jan. p. 158\*  
         high-energy-rate, Jan. p. 61; Mar. p. 90  
         of titanium, Apr. p. 115  
         pneumatic-mechanic\*, Jan. p. 67  
         rubber impact, Apr. p. 113  
     Forming machines, pneumatic-mechanical, Jan. p. 61  
     Fracture modes in stamping, May p. 97  
     Freon 11, Mar. p. 98  
     Friction and wear of cermets\*, Mar. p. 194  
     Functional dimensioning, Oct. p. 79  
     Furnace, parabolic, July p. 78  
     Furnace roll alignment, Mar. p. 99

#### —G—

Gage, eccentricity\*, May p. 90  
     locating, die\*, Jan. p. 60  
 Gages, specifying tolerances for, May p. 113  
     thread, selection of, May p. 113  
 Gaging, automatic, Jan. p. 70; Jan. p. 77  
     ultrasonic resonance, May p. 118

Gaging systems, categories of, Jan. p. 77  
 Gantt chart, June p. 76  
 Gas lasers, June p. 88  
 Gear checker, Mar. p. 88  
 Gear inspection, May p. 121  
 Gear teeth chamfer\*, Aug. p. 509  
 Gears and splines, specifying of, Aug. p. 55  
 Gears, definition of terms, Aug. p. 55  
     internal, broaching, May p. 108  
     pitting of\*, Aug. p. 510  
 Gel coatings, Feb. p. 83  
 Glasrock blocks, Mar. p. 98  
 Glass, use of as lubricant\*, Aug. p. 520  
 Granite, use of in vibratory finishing, Nov. p. 97  
 Gray iron castings, abrasive blasting of\*, Aug. p. 74  
     production of, Feb. p. 82  
 Grinding, abrasive disk, Apr. p. 203  
     accuracy, Mar. p. 107  
     contour, Nov. p. 90  
     coolants\*, Aug. p. 519  
     electrolytic, carbides\*, Dec. p. 155  
     forces\*, Feb. p. 149  
     of guideways\*, June p. 165  
     of oxide tools, June p. 71  
 Grinding machine, counterbalanced, May p. 107  
 Grinding wheel dresser\*, July p. 65  
 Grinding wheel wear\*, Apr. p. 204  
 Grinding workholder\*, Apr. p. 85  
 Guerin process, Feb. p. 90  
 Guideways, grinding of\*, June p. 165

#### —H—

Hacksaw die\*, Sept. p. 80  
 Hard tooling, definition of, Mar. p. 76  
 Hardening, explosive, Jan. p. 68  
 Hardness, obtaining in welded tools, June p. 94  
 Hastelloy X, formability, Jan. p. 63  
 Heart-lung bypass machine\*, Dec. p. 106  
 Heat and sound transfer\*, Nov. p. 187  
 Heat treatment, of large gears, July p. 75  
     of space age materials\*, June p. 178  
     temperatures, tool steel, June p. 94  
 Heavy stampings, techniques for producing, Sept. p. 88  
 Height gage, improvised\*, Aug. p. 50  
     shop made\*, Feb. p. 62  
 Helical weld tubes\*, Jan. p. 153  
 Helmets, Army, explosive forming of, Apr. p. 114  
 HERF press, Mar. p. 90  
 High-energy-rate forming, Jan. p. 61; Mar. p. 90  
     (see also Explosive forming)  
 High-speed steel, steam treating of, July p. 79  
     use of in machining thermal-resistant alloys, Nov. p. 112  
 High-strength materials, machining\*, Oct. p. 155  
 Hole sizing, June p. 65  
 Honeycomb, contouring of, Mar. p. 85  
     production, Mar. p. 97  
 Honing machine, Aug. p. 60  
 Horizontal boring and facing machine, Mar. p. 104  
 Hot-work steels, productivity rating, May p. 101  
 Hydraulic drives for numerical control\*, Nov. p. 163  
 Hydroforming, Feb. p. 91; Apr. p. 109  
 Hydrogen embrittlement in coatings, Mar. p. 82  
 Hydrostatic dies, Feb. p. 91  
 Hydrostatic extrusion\*, July p. 82  
 Hydrostatic spindles, Oct. p. 67

#### —I—

Inactive tools, Mar. p. 78  
 Incentive plan, May p. 87  
 Inconel tubes, Mar. p. 98  
 Inconel X, formability of, Jan. p. 63  
 Index table, boring mill, Apr. p. 108  
 Indexing device, numerically controlled, Dec. p. 100  
 Indexing die\*, Nov. p. 82  
 Indexing head\*, Oct. p. 64  
 Indexing hearth, July p. 76  
 Indexing lathe chuck\*, June p. 62  
 Indexing machine\*, Mar. p. 93  
 Indexing, precision, Aug. p. 67  
 Indexing systems, Aug. p. 51  
 Indicating device\*, May p. 89  
 Indicator holder\*, Apr. p. 86  
 Indicator mounting\*, Feb. p. 60  
 Information flow\*, Feb. p. 66  
 Information retrieval, Aug. p. 51  
 Infrared radiation\*, Dec. p. 156  
 Injection syringe\*, Dec. p. 107  
 Insert tooling, Dec. p. 85  
 Insert tooling in broaching, Sept. p. 92  
 Inspection (see also Statistical sampling)  
     and preventive maintenance\*, Mar. p. 197  
     components in automatic assembly machines, May p. 94  
     in gear manufacture, May p. 121  
     industrial\*, Sept. p. 215  
     numerically controlled, Jan. p. 86  
     of powder metal parts\*, Oct. p. 173  
     open setup, Oct. p. 79  
     sampling, Nov. p. 76  
     tape control, Dec. p. 90  
     transmission, air gage\*, Oct. p. 74  
     turbine blade profiles, Jan. p. 86  
 Inventory, periodic, Mar. p. 77  
 Involute forms, inspection of, May p. 121  
 Involute profile, inspection of, Mar. p. 88

—J—

Job-shop efficiency, Aug. p. 43  
Jogging magnesium extrusions, July p. 83  
Joining and terminating wire, Dec. p. 81  
Joining operations in assembly machines, May p. 96  
Joining Space-Age metals, May p. 275

—K—

Kirksite in explosive forming, Jan. p. 63

—L—

Laminated structures, Feb. p. 83  
Laminates, metal, adhesive bonding of, Aug. p. 57  
Laser materials, June p. 88  
Lasers, use of in machining and welding, June p. 85  
Lathe, alignment tool\*, Jan. p. 60  
center\*, Dec. p. 76  
chuck, indexing\*, June p. 62  
fixture\*, Mar. p. 80  
modular\*, Feb. p. 150  
turning, shell assembly, Jan. p. 88  
used as a wrapping machine\*, Jan. p. 89  
Lathe tools, rotating tips on\*, Nov. p. 165  
Law of probability, applied to machines, May p. 91  
Layouts, photographic transfer of, May p. 110  
Lead-tin, impurities in\*, Nov. p. 187  
Leaded steels, machinability of, Dec. p. 85  
Leasing programs\*, July p. 74  
Limestone, use of in vibratory finishing, Nov. p. 97  
Links, use of in information retrieval, Aug. p. 54  
Lot size, economical, Dec. p. 101  
Low-cost tooling, Feb. p. 85  
Lubricants and radiation\*, Feb. p. 164 (see also Coolants)  
Lubrication for wire drawing, Feb. p. 67  
of gear teeth\*, Mar. p. 195

—M—

Machinability tests, Dec. p. 85  
Machine beds, improvements in\*, Apr. p. 185  
Machine capability, analyses of, Sept. p. 97  
application of studies, Sept. p. 101  
Machine controls, comparison of\*, Mar. p. 191; Nov. p. 165\* (see also Numerical control)  
Machine costs, lowering, May p. 85  
Machine design, automatic, May p. 91  
ferrule removal, Nov. p. 107  
gear inspection, May p. 122  
precision, Aug. p. 65  
principles of, May p. 91  
types of mechanisms, May p. 92  
Machine, horizontal boring and facing, Mar. p. 104  
precision, control of, Aug. p. 68  
Machine tool acceptance tests\*, June p. 165  
Machine tool assembly, Russian\*, Aug. p. 509  
Machine tool depreciation\*, Apr. p. 185  
Machine tool industry, circumferential automation, May p. 82  
Machine tool parts, plastic\*, Sept. p. 201  
Machine tools, automatic control of\*, Oct. p. 153  
deformation in\*, June p. 165  
Iron Curtain\*, May p. 243  
modular\*, Apr. p. 189  
safety of\*, Feb. p. 163  
Machine welding of cobalt\*, Oct. p. 88  
Machinery replacement\*, Jan. p. 153  
Machines, filament winding, Nov. p. 102  
rigidity of\*, Nov. p. 164  
vibratory finishing, Nov. p. 93  
Machining, chemical\*, Aug. p. 521 (see also Specific operation)  
electrical discharge, Feb. p. 89  
electrochemical\*, June p. 73  
electrolytic, Feb. p. 89  
high-speed, June p. 69  
high-temperature alloys\*, Oct. p. 153  
of airfoil blades, Aug. p. 59  
of honeycomb, Mar. p. 85  
of irregular shapes\*, Nov. p. 163  
of nylon\*, May p. 120  
orbital, Feb. p. 71  
orthogonal\*, Nov. p. 189  
precision, Aug. p. 65  
tests\*, Sept. p. 217  
turbine shells, Mar. p. 104  
ultrasonic, Feb. p. 89  
with automatic chucks, June p. 95  
with lasers, June p. 85  
Machining stresses, residual\*, Apr. p. 186  
Machining time, estimating\*, Oct. p. 153  
Magnesium, adhesive bonding\*, Mar. p. 193  
extrusions, jogging, July p. 83  
(AZ31B), formability, Jan. p. 63  
Magnetic adapter for checking runout\*, Oct. p. 64  
Magnetized jacks\*, Sept. p. 80  
Maintenance evaluation\*, Mar. p. 196  
Maintenance, preventive\*, Mar. p. 197  
Mandrels, for filament winding, Nov. p. 101  
Manufacturing, at National Acme Co., May p. 82  
diversification, May p. 82

\*Brief article less than 1 page.

Manufacturing control in Russia\*, Jan. p. 152  
Manufacturing costs, Jan. p. 91  
initial, reducing, Sept. p. 202  
Manufacturing engineering, Gardner Denver, Sept. p. 83  
projects, management of, Oct. p. 61  
Manufacturing planning, Jan. p. 81; Sept. p. 78  
advance, Aug. p. 43  
measuring effectiveness of, Aug. p. 62  
Manufacturing, quality, Feb. p. 92  
research, Space-Age, Apr. p. 111  
short-order, Sept. p. 83  
Marketing, Sept. p. 78  
Martensitic low-alloy steels, producibility rating of, May p. 101  
Martensitic stainless steels, producibility rating of, May p. 101  
Material changes, observing\*, Aug. p. 64  
Material requirements for Ballizing, June p. 66  
Materials, effect on part producibility, May p. 100 (see also Specific type)  
brittle behavior of\*, Oct. p. 171  
for heavy stamping, Sept. p. 89  
science of, Dec. p. 175  
Measuring systems, English versus metric, Oct. p. 75  
Mechanical-electric gaging, Jan. p. 77  
Mechanical feeders, May p. 94  
Mechanical plating, Mar. p. 82  
Media, application of in vibratory finishing, Nov. p. 98  
Media for mechanical plating, Mar. p. 83  
Media selection for vibratory finishing, Nov. p. 97  
Medical tooling, Dec. p. 104  
Meiseng concept\*, Dec. p. 175  
Metal laminates, adhesive bonding of, Aug. p. 57  
Metal shapes, porous\*, Nov. p. 189  
Metallcutting classifications\*, Oct. p. 155  
Metallcutting, explosive, Jan. p. 68  
Metallcutting vibrations\*, May p. 276  
Metallurgy of resistance welding, Oct. p. 89  
Metals (see Specific type)  
Metals, Space-Age, joining of, May p. 275  
Metalworking explosives\*, Jan. p. 157  
Metalworking with lasers, June p. 87  
Metric vs. English measurement, Oct. p. 75  
Metrology, Army, Oct. p. 76  
Metrology conference\*, Mar. p. 189  
Micrometer center finder\*, Feb. p. 62  
Milling automotive wheel spindles, Apr. p. 110  
Milling fixture, plastic, May p. 105  
Milling, of thermal-resistant alloys, Nov. p. 112  
on a drilling machine, June p. 74  
research, face\*, Jan. p. 151  
spines\*, Dec. p. 157  
three-dimensional, fixture for\*, Aug. p. 49  
with carbides and ceramics\*, Oct. p. 172  
Missle manufacture, Jan. p. 81  
Modular machine tools\*, Apr. p. 189  
Molded rubber, steam treating of, July p. 81  
Molding, blow\*, Feb. p. 163  
Molds in cutting fluids\*, Aug. p. 520  
Molybdenum disulfide, Feb. p. 67  
Molybdenum (PH 15-7), formability, Jan. p. 63  
protecting\*, Jan. p. 159

—N—

National security, economics of\*, Apr. p. 116  
Nickel-base alloys, producibility rating, May p. 101  
Noise, industrial, combatting\*, June p. 166  
Noise problems\*, Mar. p. 189  
Nonferrous materials, steam treating of, July p. 81  
Nonleaded steels, machinability of, Dec. p. 85  
Novacelite, use of in vibratory finishing, Nov. p. 97  
Nozzle chambers, machining of, Aug. p. 45  
Number stamping fixture\*, Nov. p. 80  
Numerical control, application of in flame cutting, May p. 109  
hydraulic drives for\*, Nov. p. 163  
in manufacturing, Sept. p. 85  
in pressworking, Feb. p. 86  
use of in wiring panels, June p. 72  
Numerical controls, maintenance of\*, Mar. p. 195  
Numerically controlled drilling, Jan. p. 87  
Numerically controlled drilling machine, Sept. p. 109  
Numerically controlled indexer, Dec. p. 100  
Numerically controlled inspection, Jan. p. 86  
Numerically controlled jig boring, Nov. p. 105  
Numerically controlled machining, Jan. p. 90  
Numerically controlled punching, Oct. p. 73  
Nut runner\*, May p. 90  
Nylon parts, machining of\*, May p. 120

—O—

Obsolescence, effect of on toolcrib operations, Oct. p. 85  
Oils, grinding (see Coolants, grinding)  
Oven setup inspection, Oct. p. 79  
Optical inspection, Apr. p. 115  
Optical ray tracing technique, Apr. p. 115  
Optical tests\*, May p. 243  
Optical tooling, Mar. p. 99; Dec. p. 103\*  
Orbital machining, Feb. p. 71  
Organizational systems in manufacturing engineering, Oct. p. 61  
Orientation of parts, automatic, Oct. p. 70  
Orthogonal cutting, Apr. p. 89  
Orthogonal machining\*, Nov. p. 189

Over tooling, Feb. p. 83  
Overhead equipment, definition of, Mar. p. 76  
Oxygen-lanced cast iron\*, July p. 148

—P—

Pack cementation\*, Jan. p. 160  
Package tooling, Aug. p. 45  
Parabolic furnace, July p. 78  
Parabolic mirrors, Space-Age applications, Apr. p. 115  
Part orientation in automatic assembly, May p. 95  
Part orientation machine, Oct. p. 70  
Part transfer in automatic assembly machines, May p. 95  
Parts moving device\*, Oct. p. 65  
Percent effective, Nov. p. 78  
PERT, June p. 75  
Phase equilibrium in alloys\*, Jan. p. 157  
Phenolics, tests for\*, Nov. p. 187  
Photographic layout transfer, May p. 110  
Piercing punch, multiaction\*, June p. 64  
Pin master in gear inspection machine, May p. 122  
Pipetting device\*, Dec. p. 105  
Planning, long-range, Sept. p. 77  
manufacturing, advance, Aug. p. 43  
Planning revision records, Aug. p. 63  
Plant modernization program, May p. 85  
Plastic deformation\*, Sept. p. 215  
Plastic machine tool parts\*, Sept. p. 201  
Plastic milling fixture, May p. 105  
Plastic tooling\*, June p. 177  
Plastics, casting\*, June p. 178  
electronic\*, Oct. p. 174  
sheet forming\*, Feb. p. 162  
use of in machine tools\*, Aug. p. 511  
use of in tooling\*, Aug. p. 526  
wire reinforced\*, Nov. p. 188

Plating, mechanical, Mar. p. 82  
Pneumatic-mechanical forming, Jan. p. 67  
Pneumatic mounts, Apr. p. 99  
Polaris missiles, fabrication of engine cases for, Nov. p. 101

Polyester resins, use of in filament winding, Nov. p. 101

Polyglycol, Mar. p. 86  
Polyurethane tooling, Feb. p. 90  
Polyurethane, use of in vibratory finishing, Nov. p. 93

Portable punches, economics of, Sept. p. 95

Portable riveter\*, Aug. p. 48  
Powder-metal parts, inspection of\*, Oct. p. 173  
performance of\*, Oct. p. 174  
roll peening of, May p. 125

Powder-metallurgy iron, steam treating of, July p. 81

Powders, alloy, cermet, carbide and ceramic\*, Nov. p. 189

Power tool, multiple spindle\*, Apr. p. 107

Precipitation hardening stainless steels, producibility rating of, May p. 101

Preloaded magazine, Feb. p. 70

Press and die alignment, Dec. p. 109

Press automation, Feb. p. 85

Press tooling, Feb. p. 85

Pressure welding in cutting tools, Apr. p. 89

Pressworking\*, Jan. p. 60  
calculation of forces, Dec. p. 110  
closed forming\*, Dec. p. 77

effect of punch-die clearance, July p. 89

increasing press speed, May p. 97

of titanium, Apr. p. 115

piercing, June p. 67

powder-metal dies, Sept. p. 94

punch and die stresses, July p. 91

safety device for\*, Oct. p. 74

short-run stampings, May p. 115

stock pusher\*, Dec. p. 76

tube die\*, Feb. p. 61

Prestressed steel, fracture strength of\*, July p. 147

Printed circuits, inspection of, Aug. p. 72

Process average data, Nov. p. 76

Process engineering, rules of, Jan. p. 91

Process planning, Feb. p. 55

Process selection in welding, Nov. p. 86

Process sheets, Mar. p. 77

Processing parts through vibratory finishing, Nov. p. 100

Product innovation, at National Acme, May p. 83

Production flexibility\*, June p. 177

Production lot sizes, optimum\*, Aug. p. 509

Productivity, engineer, Jan. p. 57

in the Soviet Union, July p. 63

Program evaluation review technique, June p. 75

Programming with words\*, June p. 71

Project Apollo, Feb. p. 55

Project coordination in manufacturing engineering, Oct. p. 62

Projectors, use of in inspection, Aug. p. 72

Punch and die, clearances, July p. 89

stresses, July p. 91

Punch, piercing, multiaction\*, June p. 64

Punch presses, higher speeds for, May p. 97

Punchability, effect of speed, May p. 97

Punches and dies, Feb. p. 86

Punches, portable, economics of, Sept. p. 95

Punching, mild steel, forces required, Sept. p. 96

numerically controlled, Oct. p. 72

—Q—

Quality control, Feb. p. 92; Nov. p. 75  
in resistance welding, Oct. p. 93

Quality data system, evaluating, Nov. p. 75  
Quality manufacturing, Feb. p. 92  
Quantity discount, effect of, Dec. p. 101

—R—

Radiation and lubricants\*, Feb. p. 164  
Radiation, infrared\*, Dec. p. 156  
Radiation scanning\*, Sept. p. 108  
Radioactive oil\*, Nov. p. 109  
Radioisotopes\*, Nov. p. 109  
Radiusing by vibratory finishing, Nov. p. 94  
Reamer sharpening fixture\*, Dec. p. 77  
Recess grinding, Nov. p. 90  
Recessing tools, circular, design, Feb. p. 63  
Recirculating ball nuts, Apr. p. 98  
Rectifiers, transistor-controlled\*, Aug. p. 522  
Refractories, reinforced\*, Feb. p. 164  
Refractory alloys, joining of, May p. 275  
Refractory metals, welding of\*, July p. 92  
Reinforced refractories\*, Feb. p. 164  
Reliability\*, Feb. p. 161  
René 41, formability, Jan. p. 63  
Research and development, June p. 75  
at Ryan Aeronautical Co., Apr. p. 112  
Research, in carbide tool manufacture\*, Apr. p. 186  
Russian\*, Apr. p. 185  
Residual machining stresses\*, Apr. p. 186  
Resistance electrical heating elements, Mar. p. 98  
Resistance welding, characteristics of metal, Oct. p. 90  
of electronic assemblies, Oct. p. 89  
Retrieval systems, mechanized, Aug. p. 53  
Reusable punches and dies, Feb. p. 86  
Rigidity of machine tool elements\*, Apr. p. 185  
Rigidity of machines\*, Nov. p. 164  
Ring gears, automatic assembly, Jan. p. 74  
Ring rolling\*, June p. 177  
Riveted joints, creep of\*, Feb. p. 163  
Riveting die\*, July p. 66  
Rock arms, shell casting of, Oct. p. 86  
Role indicators in indexing, Aug. p. 53  
Roll fixture\*, Apr. p. 87  
Roll forming machine\*, Aug. p. 74  
Roll peening of powder metal parts, May p. 125  
Rolled stock, flaws in, Apr. p. 105  
Roller-bearing rigidity\*, Nov. p. 163  
Rolling mill, computer controlled, Dec. p. 92  
Rolling of splines, Sept. p. 102  
Rolling, ring\*, June p. 177  
Rolls, wire feeding, Apr. p. 103  
Rotating drillheads, Mar. p. 94  
Rotating tips on lathe tools\*, Nov. p. 165  
Roundness, attainment of in grinding, Oct. p. 67  
Roundness errors, measurement of, Oct. p. 68  
Roving, applications in filament winding, Nov. p. 102  
Rubber, die cutting of, Jan. p. 76

—S—

Safety devices, mechanical, Jan. p. 73  
Sandwich panel, brazing of, June p. 83  
Saw blades, reconditioning of, July p. 73  
Scale removal with vibratory finishing, Nov. p. 93  
Science in Soviet industry, July p. 63  
Science of materials\*, Dec. p. 175  
Scientific management, Apr. p. 81  
Screw cutoff fixture\*, Nov. p. 81  
Screws, tapping, selection of, Dec. p. 93  
Setup control in spring manufacture, Apr. p. 101  
Setup information for automation, Sept. p. 107  
Shaft stabilizer\*, Nov. p. 82  
Shear spinning\*, Jan. p. 89  
Shearing strength in metals, Sept. p. 96  
Shearing stresses in piercing, July p. 91  
Sheet metals, creep of\*, Feb. p. 161  
Shell casting of rocker arms, Oct. p. 86  
Shop equipment, definition of, Mar. p. 76  
Short-run production with automatic chuckers, June p. 95  
Short-run tooling, Mar. p. 92  
stampings, May p. 115  
Shot blasting compared with vibratory finishing, Nov. p. 95  
Shot-peening aluminum\*, Oct. p. 172  
Silica, fused, Mar. p. 97  
Silicon carbide, use of in vibratory finishing, Nov. p. 97  
Simulated rocket stage, Nov. p. 83  
Slugs, used as punches, June p. 67  
Snaking condition in wire rolling, Apr. p. 103  
Soft tooling, definition of, Mar. p. 76  
Solar energy, use of, Apr. p. 115  
Sounds and heat transfer\*, Nov. p. 187  
Soviet industry, July p. 63  
Space-Age materials, resistance of to heat and oxidation\*, May p. 119  
Space saving in small plants\*, Mar. p. 96  
Spatial coherence, June p. 87  
Special drilling machine\*, Dec. p. 75  
Special machine, drilling\*, Dec. p. 75  
Special tooling, storage of, Oct. p. 84  
Spin forging, Mar. p. 105  
Spindle excursion, minimizing, Oct. p. 67  
Spindle runout, checking\*, Oct. p. 64  
Splindles, hydrostatic, Oct. p. 67  
Spinning, shear\*, Jan. p. 89  
Spline rolling, Sept. p. 102  
Splines, milling\*, Dec. p. 157  
Splines and gears, specifying of, Aug. p. 55  
Spring manufacture, Apr. p. 101

\*Brief article less than 1 page.

Stainless steel, drawing, Feb. p. 68  
formability, Jan. p. 63  
welded, creep rupture of\*, Oct. p. 173  
Stainless steel tubing, bending of, Sept. p. 104  
Stamping design, Sept. p. 89  
Stamping forces, effect of clearance, July p. 89  
Stampings, heavy, Sept. p. 87  
Standard components, use of in machine design, Aug. p. 75  
Standardization, benefits of\*, June p. 177  
in tooling, Apr. p. 82  
Standards and standardization\*, Feb. p. 68  
GM electrical\*, Aug. p. 521  
Standoff Operations, (see Explosive forming)  
Star centers, Jan. p. 88  
Statistical analysis applied to machine capability, Sept. p. 98  
Statistical sampling, Nov. p. 76  
Steam treating, July p. 79  
Steel (see also Alloys)  
Steel (50 carbon), stamping, Sept. p. 96  
(cold-drawn), stamping, Sept. p. 96  
(1010), formability, Jan. p. 63  
(4130), formability, Jan. p. 63  
mild, stamping, Sept. p. 96  
stainless (18-8), stamping, Sept. p. 96  
structural, high-strength, fracture of\*, Aug. p. 522  
tool, welding of, June p. 92  
Steel castings, cooling of\*, July p. 150  
Steel rule die, Feb. p. 87; June p. 79  
Stereo chest X-rays\*, Dec. p. 105  
Stereomicroscope, electron beam, July p. 69  
Stick-slip\*, Oct. p. 153  
Stock feeding device\*, July p. 67  
Stress and fatigue, residual\*, May p. 282  
Stress, crack tip\*, Sept. p. 215  
Stress relieving by vibratory finishing, Nov. p. 96  
Stress relieving of welds, June p. 93  
Surface finish, determining\*, Sept. p. 202  
Surface plate flatness, Apr. p. 99

—T—

Tantalum, formability, Jan. p. 63  
Tap wrench, Aug. p. 49\*; Sept. p. 82\*  
Taper gage\*, Apr. p. 87  
Tapping fixture for acme threads\*, June p. 64  
Tapping screws, selection, Dec. p. 93  
Technicians, engineering, Jan. p. 57  
training of, Jan. p. 58  
Technological competition, U.S. vs. U.S.S.R., Oct. p. 76  
Temperature welding in cutting tools, Apr. p. 89  
Tensile failure in punching, May p. 98  
Tensile stress, ratio of to shear stress in punching, May p. 98  
Testing endurance\*, June p. 62  
Testing machine for stressing aluminum alloys\*, Oct. p. 88  
Testing of transporters, Nov. p. 83  
Testing with computers\*, July p. 147  
Thermal-resistant alloys, machining of, Nov. p. 110  
Thermal shock in welding, minimizing, June p. 94  
Thermosetting acrylics\*, Oct. p. 174  
Thread gages, selection of, May p. 113  
Thread rolling, parts orientation for, Oct. p. 70  
Tin-lead, impurities in\*, Nov. p. 187  
Titanium, alloys, producibility rating, May p. 101  
(B120 VCA), formability, Jan. p. 63  
(6A1-4V), formability, Jan. p. 63  
pressworking of, Apr. p. 115  
thin welding of, June p. 82  
welding of, July p. 70  
Tolerances, bonus, Oct. p. 79  
Tonnage meter\*, Mar. p. 93  
Tonnage requirements for mild steel, Sept. p. 96  
Tool care, Mar. p. 77  
Tool chartering\*, June p. 63  
Tool control, Oct. p. 83  
cards, Oct. p. 83  
program, Dec. p. 71  
Tool costs, Apr. p. 81  
Toolcrib organization, Oct. p. 83  
Tool design, aluminum-oxide tools, June p. 70  
for machining thermal-resistant alloys, Nov. p. 112  
requirements, Mar. p. 77  
Tool failures, examples of, Apr. p. 90  
Tool geometry in metalcutting\*, Oct. p. 171  
Tool identification, Mar. p. 78  
Tool leasing program\*, July p. 74  
Tool steel heat-treatment temperatures, June p. 94  
Tool steels (see Alloys, see Steel)  
Tool storage, Oct. p. 83  
Tool wear\*, May p. 278  
Tooling, accountable, definition of, Mar. p. 76  
cast nylon, Dec. p. 78  
design for furnace brazing, May p. 275  
electron beam, July p. 70  
epoxy plastic, May p. 103  
expendable, definition of, Mar. p. 76  
explosive forming, Jan. p. 62  
explosive-gas forming, Jan. p. 66  
for automation, Sept. p. 106  
for powder-metal parts, Sept. p. 94  
for short-run manufacturing, Sept. p. 109  
for the handicapped\*, May p. 117  
government-owned, Mar. p. 75  
hard, definition of, Mar. p. 76  
insert, in broaching, Sept. p. 92  
low-cost, Feb. p. 85

Tooling (cont.)  
medical, Dec. p. 104  
optical, Mar. p. 99  
package, Aug. p. 45  
plastic\*, June p. 90  
polyurethane, Feb. p. 90  
short-run, Mar. p. 92  
soft, definition of, Mar. p. 76  
with plastics\*, Aug. p. 526

Toolroom efficiency, Apr. p. 81  
Tools, aluminum-oxide, June p. 69  
commercial modified, Dec. p. 74  
commercial standard, Dec. p. 74  
identification of, Dec. p. 73  
multiple purpose special, Dec. p. 74  
single purpose special, Dec. p. 74  
Torch cluster, mobile, July p. 75  
Torque tension tester, Apr. p. 106  
Torque variations, use in machine control, June p. 84  
Tracer control, Nov. p. 90  
Tracer control in milling, Aug. p. 59  
Transfer assembly machine, Jan. p. 69  
Transfer device for stampings, Apr. p. 98  
Transfer machine, automatic assembly, Jan. p. 74  
Transistor-controlled rectifiers\*, Aug. p. 522  
Trunnion type milling and drilling machine, June p. 74  
Tube drawing, ultrasonic\*, Aug. p. 58  
Tube failure in machine tools, Apr. p. 96  
Tube sizing die\*, Feb. p. 61  
Tubing, stainless steel, bending of, Sept. p. 104  
Tumbling stamped parts, Mar. p. 84  
Tungsten inert gas welding, July p. 70  
Tungsten, joining of, May p. 275  
Turbine shafts, rolling of\*, Jan. p. 89  
Turn mill\*, Aug. p. 520  
Turret lathe, punch card control of\*, May p. 244

—U—

Ultrasonic gaging, May p. 118  
Ultrasonic machining, Feb. p. 89  
Ultrasonic testing of castings\*, Sept. p. 108  
Ultrasonic tube drawing\*, Aug. p. 58  
Ultrasonic welding\*, May p. 119; May p. 276  
Ultrasonics, applied\*, May p. 281  
Underbead cracking, June p. 93  
Unit term indexing, Aug. p. 52  
UPPS machine, Aug. p. 65

—V—

Vacuum brazing, June p. 83  
Value analysis, June p. 59  
Vascojet 1000, formability, Jan. p. 63  
Vendor rating systems\*, Sept. p. 215  
Vernier, optical, Apr. p. 97  
Vibration, boring mill\*, Sept. p. 201  
cutting tool, Feb. p. 77  
dampening, Dec. p. 78  
damping\*, Feb. p. 161  
damping in machine tools\*, Jan. p. 152  
decay rates, Feb. p. 78  
effects on surface plates, Apr. p. 100  
self-induced in metalcutting\*, May p. 276  
Vibratory feeders, May p. 94  
Vibratory finishing\*, Apr. p. 107  
fundamentals of, Nov. p. 93  
limitations of, Nov. p. 96  
special characteristics of, Nov. p. 96

—W—

Ways, protection of\*, Feb. p. 149  
Wear in grinding wheels\*, Apr. p. 204  
Weld characteristics, electron beam, July p. 69  
Weld cracking, June p. 92  
Welded stainless steel, creep rupture\*, Oct. p. 173  
Welding, arc, filler wire in\*, Oct. p. 155  
automatic, Nov. p. 87  
corner\*, Jan. p. 59 (see also Joining)  
electron beam, July p. 68; Oct. p. 82  
explosive, Jan. p. 68  
helix-wound tubes\*, Feb. p. 150  
inert gas shield, June p. 82  
mechanical, Nov. p. 85  
mobile, Nov. p. 106  
of dissimilar materials, July p. 70  
of tool steels, June p. 92  
refractory metals\*, July p. 92  
resistance, metallurgy of, Oct. p. 89  
semiautomatic, Nov. p. 87  
submerged-arc, Nov. p. 87  
tool steels, June p. 92  
tungsten inert gas, July p. 70  
ultrasonic\*, May p. 119; May p. 276  
vapor shielded, Nov. p. 87  
with lasers, June p. 85  
Welding fixtures, mechanized, Nov. p. 88  
Welding machines, resistance, Oct. p. 92  
Welds, stress relieving of, June p. 93  
Welding with diamond cutters, Mar. p. 107  
Wire drawing, Feb. p. 67; Oct. p. 171\*  
Wire joining and terminating, Dec. p. 81  
Wire reinforced plastics\*, Nov. p. 188  
Wiring by numerical control, June p. 72  
Words, use of in programming\*, June p. 71  
Writing of engineering reports, Feb. p. 72

—Z—

Zone melting\*, Jan. p. 159